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SEQUENCE LISTING

A
<110> THE JOHNS HOPKINS UNIVERSITY SCHOOL OF MEDICINE
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<120> GLUTAMATE TRANSPORTER ASSOCIATED PROTEINS AND METHODS OF USE THEREOF

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Gly Gln Tyr Ser Asp Ile Asn Asn Arg Trp Asp Leu Pro Asp Ser Asp
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Trp Asp Asn Asp Ser Ser Ala Arg Leu Phe Glu Arg Ser Arg Ile
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Lys Ala Leu Ala Asp Glu Arg Ala Val Gln Lys Lys Thr Phe Thr
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Lys Trp Val Asn Ser His Leu Ala Arg Val Thr Cys Arg Val Gly Asp
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Leu Tyr Ser Asp Leu Arg Asp Gly Arg Asn Leu Leu Arg Leu Leu Glu
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48

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att cac tgc ctg gag aat gtc gac aaa gca ctg cag ttc ctg aag gag	384
Ile His Cys Leu Glu Asn Val Asp Lys Ala Leu Gln Phe Leu Lys Glu	
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Gln Lys Val His Leu Glu Asn Met Gly Ser His Asp Ile Val Asp Gly	
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Asn His Arg Leu Thr Leu Gly Leu Val Trp Thr Ile Ile Leu Arg Phe	
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Thr Pro Arg Glu Gly Arg Leu Ile Ser Asp Ile Asn Lys Ala Trp Glu			
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Trp Asp Phe Leu Arg Glu Met Val Ala Ala Arg Arg Glu Arg Leu Leu			
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Lys His Leu Ala Gly Val Glu Asp Leu Leu Gln Leu His Glu Leu Val			
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965 970 975		
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Lys Thr Lys Val Ile Glu Ser Thr Gln Asp Leu Gly Asn Asp Leu Ala		
980 985 990		
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Gly Val Leu Ala Leu Gln Arg Lys Leu Ala Gly Thr Glu Arg Asp Leu		
995 1000 1005		
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Glu Ala Ile Ser Ala Arg Val Gly Glu Leu Thr Gln Glu Ala Asn		
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Ser Ser	Gln Glu Tyr Val Leu	Ser His Thr Glu Met	Pro Gly Thr	
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Leu Gln	Ala Ala Asp Ala Ala	Ile Lys Lys Leu Glu	Asp Phe Met	
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Ser Thr	Met Asp Ala Asn Gly	Glu Arg Ile Arg Gly	Leu Leu Glu	
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Ala Gly	Arg Gln Leu Val Ser	Lys Gly Asn Ile His	Ala Glu Lys	
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Ile Gln	Glu Lys Ala Asp Ser	Ile Glu Lys Arg His	Arg Lys Asn	
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Gln Glu	Ala Val Gln Gln Leu	Leu Gly Arg Leu Arg	Asp Asn Arg	
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Glu Gln	Gln His Phe Leu Gln	Asp Cys Gln Glu Leu	Lys Leu Trp	
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Val	Ser	Glu	Lys	Leu	Glu	Asp	Leu	His	Arg	Arg	Trp	Asp	Glu	Leu	
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Glu	Thr	Thr	Thr	Gln	Ala	Lys	Ala	Arg	Ser	Leu	Phe	Asp	Ala	Asn	
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Arg	Ala	Glu	Leu	Phe	Ala	Gln	Ser	Cys	Ser	Ala	Leu	Glu	Ser	Trp	
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Leu	Glu	Ser	Leu	Gln	Ala	Gln	Leu	His	Ser	Asp	Asp	Tyr	Gly	Lys	
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Asp	Leu	Thr	Ser	Val	Asn	Ile	Leu	Leu	Lys	Lys	Gln	Gln	Met	Leu	
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Val	Glu	Arg	Thr	Ser	Arg	Ala	Val	Glu	Glu	Lys	Phe	Arg	Ala	Leu	
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Cys	Gln	Pro	Met	Lys	Asp	Arg	Cys	Arg	Arg	Leu	Gln	Ala	Ser	Arg	
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Glu	Gln	His	Gln	Phe	His	Arg	Asp	Val	Glu	Asp	Glu	Ile	Leu	Trp	
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Asp	Leu	Pro	Ser	Val	Gln	Leu	Leu	Met	Lys	Lys	Asn	Gln	Thr	Leu	

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Tyr Arg Asp Ala Ala Glu Ala	Glu Ala Trp Met Gly	Glu Gln Glu	
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tta cat atg atg ggc cag gaa	aag gcc aag gat gag	ctg agc gcc	4869
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Gln Ala Glu Val Lys Lys His	Gln Val Leu Glu Gln	Ala Leu Ala	
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1670	1675	1680	
gga gag cgg cgt gag cgt ctg	cag gag cac ctc agg	ctg tgc cag	5094
Gly Glu Arg Arg Glu Arg Leu	Gln Glu His Leu Arg	Leu Cys Gln	
1685	1690	1695	
ctc cgc aga gag ctg gat gac	ctg gag cag tgg ata	cag gag cga	5139
Leu Arg Arg Glu Leu Asp Asp	Leu Glu Gln Trp Ile	Gln Glu Arg	
1700	1705	1710	
gaa gtc gtg gca gcc tcc cat	gaa ctg ggc cag gac	tat gag cat	5184
Glu Val Val Ala Ala Ser His	Glu Leu Gly Gln Asp	Tyr Glu His	
1715	1720	1725	
gtg act atg ctt cgg gac aaa	ttc cga gag ttc tcc	agg gac acc	5229
Val Thr Met Leu Arg Asp Lys	Phe Arg Glu Phe Ser	Arg Asp Thr	
1730	1735	1740	
agc acc att ggc caa gag cgt	gta gac agt gcc aat	gcc ctg gcc	5274
Ser Thr Ile Gly Gln Glu Arg	Val Asp Ser Ala Asn	Ala Leu Ala	
1745	1750	1755	

aat	ggg	ctc	att	gct	ggg	ggc	cat	gct	gca	tgg	gcc	acc	gtg	gcc	5319
Asn	Gly	Leu	Ile	Ala	Gly	Gly	His	Ala	Ala	Trp	Ala	Thr	Val	Ala	
1760						1765					1770				
gag	tgg	aag	gac	agt	ctc	aat	gag	gcc	tgg	gct	gac	ctg	ctg	gag	5364
Glu	Trp	Lys	Asp	Ser	Leu	Asn	Glu	Ala	Trp	Ala	Asp	Leu	Leu	Glu	
1775						1780					1785				
ctg	ctg	gac	aca	aga	ggt	cag	gtg	ctg	gct	gct	gct	tat	gag	ctg	5409
Leu	Leu	Asp	Thr	Arg	Gly	Gln	Val	Leu	Ala	Ala	Ala	Tyr	Glu	Leu	
1790						1795					1800				
cag	cgc	ttc	ctg	cat	ggg	gcc	cgc	caa	gcc	ctg	gca	cgg	gtg	cag	5454
Gln	Arg	Phe	Leu	His	Gly	Ala	Arg	Gln	Ala	Leu	Ala	Arg	Val	Gln	
1805						1810					1815				
cac	aag	cag	cag	cag	ctt	cca	gat	ggg	acg	ggc	cgc	gac	ctc	aat	5499
His	Lys	Gln	Gln	Gln	Leu	Pro	Asp	Gly	Thr	Gly	Arg	Asp	Leu	Asn	
1820						1825					1830				
gct	gct	gag	gcc	ctg	cag	cgc	cgg	cac	tgc	gcc	tat	gag	cac	gac	5544
Ala	Ala	Glu	Ala	Leu	Gln	Arg	Arg	His	Cys	Ala	Tyr	Glu	His	Asp	
1835						1840					1845				
atc	caa	gcc	ctc	agc	act	cag	gtc	cag	cag	gtt	cag	gac	gat	ggc	5589
Ile	Gln	Ala	Leu	Ser	Thr	Gln	Val	Gln	Gln	Val	Gln	Asp	Asp	Gly	
1850						1855					1860				
ctc	agg	cta	caa	aag	gcc	tat	gct	gga	gac	aag	gct	gag	gaa	att	5634
Leu	Arg	Leu	Gln	Lys	Ala	Tyr	Ala	Gly	Asp	Lys	Ala	Glu	Glu	Ile	
1865						1870					1875				
ggc	cgt	cac	atg	cag	gca	gtg	gct	gag	gcg	tgg	gcc	cag	ctc	cag	5679
Gly	Arg	His	Met	Gln	Ala	Val	Ala	Glu	Ala	Trp	Ala	Gln	Leu	Gln	
1880						1885					1890				
gga	agt	tct	gct	gcc	cgt	cgc	cag	ctg	tta	ctg	gat	acc	aca	gac	5724
Gly	Ser	Ser	Ala	Ala	Arg	Arg	Gln	Leu	Leu	Leu	Asp	Thr	Thr	Asp	
1895						1900					1905				
aaa	ttc	cga	ttc	ttc	aag	gct	gtc	cg	gag	ttg	atg	ctg	tgg	atg	5769
Lys	Phe	Arg	Phe	Phe	Lys	Ala	Val	Arg	Glu	Leu	Met	Leu	Trp	Met	
1910						1915					1920				
gat	ggg	att	aac	ctg	cag	atg	gat	gcc	cag	gag	agg	ccc	cg	gat	5814
Asp	Gly	Ile	Asn	Leu	Gln	Met	Asp	Ala	Gln	Glu	Arg	Pro	Arg	Asp	
1925						1930					1935				
gtg	tcc	tct	gca	gat	tta	gtc	atc	aaa	aac	caa	caa	ggc	atc	aaa	5859
Val	Ser	Ser	Ala	Asp	Leu	Val	Ile	Lys	Asn	Gln	Gln	Gly	Ile	Lys	
1940						1945					1950				
gca	gag	ata	gag	gca	aga	gct	gac	agg	tcc	tcc	gcc	tgc	att	gac	5904
Ala	Glu	Ile	Glu	Ala	Arg	Ala	Asp	Arg	Phe	Ser	Ala	Cys	Ile	Asp	
1955						1960					1965				
atg	ggg	caa	gag	ctg	ctg	gcc	cgg	aac	cac	tat	gcc	gct	gag	gag	5949
Met	Gly	Gln	Glu	Leu	Leu	Ala	Arg	Asn	His	Tyr	Ala	Ala	Glu	Glu	
1970						1975					1980				

atc	tca	gag	aag	ctg	tct	cag	cta	cag	tcc	cg _g	cgc	cag	gag	aca	5994
Ile	Ser	Glu	Lys	Leu	Ser	Gln	Leu	Gln	Ser	Arg	Arg	Gln	Glu	Thr	
1985						1990						1995			
gct	gaa	aag	tgg	cag	gag	aag	atg	gac	tgg	cta	cag	ctt	gtt	ttg	6039
Ala	Glu	Lys	Trp	Gln	Glu	Lys	Met	Asp	Trp	Leu	Gln	Leu	Val	Leu	
2000						2005						2010			
gag	gtg	ctt	gtg	ttt	ggg	aga	gat	gca	ggc	atg	gca	gag	gcc	tgg	6084
Glu	Val	Leu	Val	Phe	Gly	Arg	Asp	Ala	Gly	Met	Ala	Glu	Ala	Trp	
2015						2020						2025			
cta	tgc	agt	cag	gag	cca	ttg	gtg	cga	agt	gca	gaa	ctg	ggt	tgc	6129
Leu	Cys	Ser	Gln	Glu	Pro	Leu	Val	Arg	Ser	Ala	Glu	Leu	Gly	Cys	
2030						2035						2040			
act	gtg	gat	gaa	gta	gag	agc	ctc	atc	aag	cgg	cat	gaa	gcc	ttc	6174
Thr	Val	Asp	Glu	Val	Glu	Ser	Leu	Ile	Lys	Arg	His	Glu	Ala	Phe	
2045						2050						2055			
cag	aag	tca	gca	gtg	gcc	tgg	gag	gag	cgt	ttc	agt	gcc	ctg	gag	6219
Gln	Lys	Ser	Ala	Val	Ala	Trp	Glu	Glu	Arg	Phe	Ser	Ala	Leu	Glu	
2060						2065						2070			
aag	ctc	act	g _c g	ctg	gaa	gag	cgg	gag	aat	gag	cag	aaa	agg	aag	6264
Lys	Leu	Thr	Ala	Leu	Glu	Glu	Arg	Glu	Asn	Glu	Gln	Lys	Arg	Lys	
2075						2080						2085			
agg	gag	gag	gag	gaa	cga	agg	aaa	cag	ccc	cct	act	tca	gag	ccc	6309
Arg	Glu	Glu	Glu	Glu	Arg	Arg	Lys	Gln	Pro	Pro	Thr	Ser	Glu	Pro	
2090						2095						2100			
atg	gct	agt	caa	ccg	gaa	ggg	agt	ctg	gta	gat	ggc	cag	aga	gtt	6354
Met	Ala	Ser	Gln	Pro	Glu	Gly	Ser	Leu	Val	Asp	Gly	Gln	Arg	Val	
2105						2110						2115			
ctt	gac	act	gcc	tgg	gat	ggg	acc	cag	tca	aaa	ttg	cca	cca	tcc	6399
Leu	Asp	Thr	Ala	Trp	Asp	Gly	Thr	Gln	Ser	Lys	Leu	Pro	Pro	Ser	
2120						2125						2130			
aca	caa	gca	ccc	agc	att	aat	ggg	gtc	tgc	acg	gac	acg	gag	tcc	6444
Thr	Gln	Ala	Pro	Ser	Ile	Asn	Gly	Val	Cys	Thr	Asp	Thr	Glu	Ser	
2135						2140						2145			
tca	cag	cct	ctg	ttg	gaa	cag	caa	aga	ctt	gaa	cag	agc	aat	gtc	6489
Ser	Gln	Pro	Leu	Leu	Glu	Gln	Gln	Arg	Leu	Glu	Gln	Ser	Asn	Val	
2150						2155						2160			
cca	gaa	ggg	cct	gga	tct	ggc	aca	gga	gac	gag	tcc	agc	ggg	ccc	6534
Pro	Glu	Gly	Pro	Gly	Ser	Gly	Thr	Gly	Asp	Glu	Ser	Ser	Gly	Pro	
2165						2170						2175			
cgg	gga	gag	agg	cag	acc	ctg	ccc	cgg	ggc	cct	gtc	ccg	tct	cca	6579
Arg	Gly	Glu	Arg	Gln	Thr	Leu	Pro	Arg	Gly	Pro	Ala	Pro	Ser	Pro	
2180						2185						2190			
atg	ccc	cag	agc	aga	tcg	tct	gag	tca	gct	cat	gtt	gcc	acc	ctg	6624
Met	Pro	Gln	Ser	Arg	Ser	Ser	Glu	Ser	Ala	His	Val	Ala	Thr	Leu	
2195						2200						2205			
ccc	gca	cga	ggt	gct	gag	ctc	tct	gct	cag	gaa	cag	atg	gaa	ggg	6669

Pro	Ala	Arg	Gly	Ala	Glu	Leu	Ser	Ala	Gln	Glu	Gln	Met	Glu	Gly	
2210					2215					2220					
acg	ctg	tgc	cgc	aaa	cag	gag	atg	gaa	gcc	tcc	aat	aag	aaa	gct	6714
Thr	Leu	Cys	Arg	Lys	Gln	Glu	Met	Glu	Ala	Phe	Asn	Lys	Lys	Ala	
2225					2230					2235					
gcc	aac	agg	tcc	tgg	cag	aat	gtg	tac	tgt	gta	ctt	cgg	cgt	gga	6759
Ala	Asn	Arg	Ser	Trp	Gln	Asn	Val	Tyr	Cys	Val	Leu	Arg	Arg	Gly	
2240					2245					2250					
agc	ctc	ggc	ttt	tac	aag	gat	gcc	agg	gca	gct	agt	gca	gga	gtg	6804
Ser	Leu	Gly	Phe	Tyr	Lys	Asp	Ala	Arg	Ala	Ala	Ser	Ala	Gly	Val	
2255					2260					2265					
cca	tac	cat	gga	gaa	gtg	cct	gtc	agt	ctg	gcc	agg	gcc	cag	ggc	6849
Pro	Tyr	His	Gly	Glu	Val	Pro	Val	Ser	Leu	Ala	Arg	Ala	Gln	Gly	
2270					2275					2280					
agt	gtg	gcc	ttt	gat	tat	cgg	aaa	cgc	aaa	cat	gtc	ttc	aag	ctg	6894
Ser	Val	Ala	Phe	Asp	Tyr	Arg	Lys	Arg	Lys	His	Val	Phe	Lys	Leu	
2285					2290					2295					
ggc	ttg	cag	gat	ggg	aaa	gag	tat	cta	ttc	cag	gcc	aag	gat	gag	6939
Gly	Leu	Gln	Asp	Gly	Lys	Glu	Tyr	Leu	Phe	Gln	Ala	Lys	Asp	Glu	
2300					2305					2310					
gca	gag	atg	agc	tca	tgg	ctg	aga	gtg	gtg	aat	gca	gcc	att	gcc	6984
Ala	Glu	Met	Ser	Ser	Trp	Leu	Arg	Val	Val	Asn	Ala	Ala	Ile	Ala	
2315					2320					2325					
act	gct	tcc	tcg	gcc	tct	gga	gag	cca	gaa	gag	cca	gtg	gtg	ccc	7029
Thr	Ala	Ser	Ser	Ala	Ser	Gly	Glu	Pro	Glu	Glu	Pro	Val	Val	Pro	
2330					2335					2340					
agt	gcc	agc	cgg	ggt	ctg	acc	agg	gcc	atg	acc	atg	ccc	cca	gtg	7074
Ser	Ala	Ser	Arg	Gly	Leu	Thr	Arg	Ala	Met	Thr	Met	Pro	Pro	Val	
2345					2350					2355					
tca	cag	cct	gag	ggc	tcc	atc	gtg	ctt	cgc	agc	aag	gat	ggc	aga	7119
Ser	Gln	Pro	Glu	Gly	Ser	Ile	Val	Leu	Arg	Ser	Lys	Asp	Gly	Arg	
2360					2365					2370					
gaa	aga	gag	cga	gaa	aaa	cga	ttc	agc	ttc	ttt	aag	aag	aac	aag	7164
Glu	Arg	Glu	Arg	Glu	Lys	Arg	Phe	Ser	Phe	Phe	Lys	Lys	Asn	Lys	
2375					2380					2385					
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gtcgacagag	accacc														7240

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 <400> 2

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Gly Gln Tyr Ser Asp Ile Asn Asn Arg Trp Asp Leu Pro Asp Ser Asp
20 25 30

Trp Asp Asn Asp Ser Ser Ser Ala Arg Leu Phe Glu Arg Ser Arg Ile
35 40 45

Lys Ala Leu Ala Asp Glu Arg Glu Ala Val Gln Lys Lys Thr Phe Thr
50 55 60

Lys Trp Val Asn Ser His Leu Ala Arg Val Thr Cys Arg Val Gly Asp
65 70 75 80

Leu Tyr Ser Asp Leu Arg Asp Gly Arg Asn Leu Leu Arg Leu Leu Glu
85 90 95

Val Leu Ser Gly Glu Thr Leu Pro Lys Pro Thr Lys Gly Arg Met Arg
100 105 110

Ile His Cys Leu Glu Asn Val Asp Lys Ala Leu Gln Phe Leu Lys Glu
115 120 125

Gln Lys Val His Leu Glu Asn Met Gly Ser His Asp Ile Val Asp Gly
130 135 140

Asn His Arg Leu Thr Leu Gly Leu Val Trp Thr Ile Ile Leu Arg Phe
145 150 155 160

Gln Ile Gln Asp Ile Ser Val Glu Thr Glu Asp Asn Lys Glu Lys Lys
165 170 175

Ser Ala Lys Asp Ala Leu Leu Trp Cys Gln Met Lys Thr Ala Gly
180 185 190

Tyr Pro Asn Val Asn Val His Asn Phe Thr Thr Ser Trp Arg Asp Gly
195 200 205

Leu Ala Phe Asn Ala Ile Val His Lys His Arg Pro Asp Leu Leu Asp
210 215 220

Phe Glu Ser Leu Lys Lys Cys Asn Ala His Tyr Asn Leu Gln Asn Ala
225 230 235 240

Phe Asn Leu Ala Glu Lys Glu Leu Gly Leu Thr Lys Leu Leu Asp Pro
245 250 255

Glu Asp Val Asn Val Asp Gln Pro Asp Glu Lys Ser Ile Ile Thr Tyr
260 265 270

Val Ala Thr Tyr Tyr His Tyr Phe Ser Lys Met Lys Ala Leu Ala Val
275 280 285

Glu Gly Lys Arg Ile Gly Lys Val Leu Asp His Ala Met Glu Ala Glu
290 295 300

His Leu Val Glu Lys Tyr Glu Ser Leu Ala Ser Glu Leu Leu Gln Trp
305 310 315 320

Ile Glu Gln Thr Ile Gly Thr Phe Asn Asp Arg Gln Leu Ala Asn Ser
325 330 335

Leu Ser Gly Val Gln Asn Gln Leu Gln Ser Phe Asn Ser Tyr Arg Thr
340 345 350

Val Glu Lys Pro Pro Lys Phe Thr Glu Lys Gly Asn Leu Glu Val Leu
355 360 365

Leu Phe Thr Ile Gln Ser Lys Leu Arg Ala Asn Asn Gln Lys Val Tyr
370 375 380

Thr Pro Arg Glu Gly Arg Leu Ile Ser Asp Ile Asn Lys Ala Trp Glu
385 390 395 400

Arg Leu Glu Lys Ala Glu His Glu Arg Glu Leu Ala Leu Arg Thr Glu
405 410 415

Leu Ile Arg Gln Glu Lys Leu Glu Gln Leu Ala Ala Arg Phe Asp Arg
420 425 430

Lys Ala Ala Met Arg Glu Thr Trp Leu Ser Glu Asn Gln Arg Leu Val
435 440 445

Ser Gln Asp Asn Phe Gly Leu Glu Leu Ala Ala Val Glu Ala Ala Val
450 455 460

Arg Lys His Glu Ala Ile Glu Thr Asp Ile Val Ala Tyr Ser Gly Arg
465 470 475 480

Val Gln Ala Val Asp Ala Val Ala Ala Glu Leu Ala Ala Glu His Tyr
485 490 495

His Asp Ile Lys Arg Ile Ala Ala Arg Gln Asn Asn Val Ala Arg Leu
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Trp Asp Phe Leu Arg Glu Met Val Ala Ala Arg Arg Glu Arg Leu Leu
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Leu Asn Leu Glu Leu Gln Lys Val Phe Gln Asp Leu Leu Tyr Leu Met
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Asp Trp Met Ala Glu Met Lys Gly Arg Leu Gln Ser Gln Asp Leu Gly
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Lys His Leu Ala Gly Val Glu Asp Leu Leu Gln Leu His Glu Leu Val
 565 570 575

Glu Ala Asp Ile Ala Val Gln Ala Glu Arg Val Arg Ala Val Ser Ala
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Ser Ala Leu Arg Phe Cys Asp Pro Gly Lys Glu Tyr Arg Pro Cys Gly
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Pro Gln Leu Val Ser Glu Arg Val Ala Thr Leu Glu Gln Ser Tyr Glu
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Ala Leu Cys Glu Leu Ala Ala Thr Arg Arg Ala Arg Leu Glu Glu Ser
 625 630 635 640

Arg Arg Leu Trp Arg Phe Leu Trp Glu Val Gly Glu Ala Glu Ala Trp
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Val Arg Glu Gln Gln His Leu Leu Ala Ser Ala Glu Thr Gly Arg Asp
 660 665 670

Leu Thr Gly Val Leu Arg Leu Leu Asn Lys His Thr Ala Leu Arg Gly
 675 680 685

Glu Met Ser Gly Arg Leu Gly Pro Leu Lys Leu Thr Leu Glu Gln Gly
 690 695 700

Gln Gln Leu Val Ala Glu Gly His Pro Gly Ala Asn Gln Ala Ser Thr
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Arg Ala Ala Glu Leu Gln Ala Gln Trp Glu Arg Leu Glu Ala Leu Ala
 725 730 735

Glu Glu Arg Ala Gln Arg Leu Ala Gln Ala Ala Ser Leu Tyr Gln Phe

740

745

750

Gln Ala Asp Ala Asn Asp Met Glu Ala Trp Leu Val Asp Ala Leu Arg
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Leu Val Ser Ser Pro Glu Val Gly His Asp Glu Phe Ser Thr Gln Ala
770 775 780

Leu Ala Arg Gln His Arg Ala Leu Glu Glu Glu Ile Arg Ala His Arg
785 790 795 800

Pro Thr Leu Asp Ala Leu Arg Glu Gln Ala Ala Ala Leu Pro Pro Ala
805 810 815

Leu Ser His Thr Pro Glu Val Gln Gly Arg Val Pro Thr Leu Glu Gln
820 825 830

His Tyr Glu Glu Leu Gln Ala Arg Ala Gly Glu Arg Ala Arg Ala Leu
835 840 845

Glu Ala Ala Leu Ala Phe Tyr Thr Met Leu Ser Glu Ala Gly Ala Cys
850 855 860

Gly Leu Trp Val Glu Glu Lys Glu Gln Trp Leu Asn Gly Leu Ala Leu
865 870 875 880

Pro Glu Arg Leu Glu Asp Pro Glu Val Val Gln Gln Arg Phe Glu Thr
885 890 895

Leu Glu Pro Glu Met Asn Ala Leu Ala Ala Arg Ile Thr Ala Val Ser
900 905 910

Asp Ile Ala Glu Gln Leu Leu Lys Ala Ser Pro Pro Gly Lys Asp Arg
915 920 925

Ile Ile Gly Thr Gln Glu Gln Leu Asn Gln Arg Trp Gln Gln Phe Arg
930 935 940

Ser Leu Ala Gly Gly Lys Lys Ala Ala Leu Thr Ser Ala Leu Ser Ile
945 950 955 960

Gln Asn Tyr His Leu Glu Cys Thr Glu Thr Gln Ala Trp Met Arg Glu
965 970 975

Lys Thr Lys Val Ile Glu Ser Thr Gln Asp Leu Gly Asn Asp Leu Ala
980 985 990

Gly Val Leu Ala Leu Gln Arg Lys Leu Ala Gly Thr Glu Arg Asp Leu
995 1000 1005

Glu Ala Ile Ser Ala Arg Val Gly Glu Leu Thr Gln Glu Ala Asn
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Ala Leu Ala Ala Gly His Pro Ala Gln Ala Pro Ala Ile Asn Thr
1025 1030 1035

Arg Leu Gly Glu Val Gln Thr Gly Trp Glu Asp Leu Arg Ala Thr
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Met Arg Arg Arg Glu Glu Ser Leu Gly Glu Ala Arg Arg Leu Gln
1055 1060 1065

Asp Phe Leu Arg Ser Leu Asp Asp Phe Gln Ala Trp Leu Gly Arg
1070 1075 1080

Thr Gln Thr Ala Val Ala Ser Glu Glu Gly Pro Ala Thr Leu Pro
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Glu Ala Glu Ala Leu Leu Ala Gln His Ala Ala Leu Arg Gly Glu
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Val Glu Arg Ala Gln Ser Glu Tyr Ser Arg Leu Arg Thr Leu Gly
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Glu Glu Val Thr Arg Asp Gln Ala Asp Pro Gln Cys Leu Phe Leu
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Arg Gln Arg Leu Glu Ala Leu Gly Thr Gly Trp Glu Glu Leu Gly
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Arg Met Trp Glu Ser Arg Gln Gly Arg Leu Ala Gln Ala His Gly
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Phe Gln Gly Phe Leu Arg Asp Ala Arg Gln Ala Glu Gly Val Leu
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Ser Ser Gln Glu Tyr Val Leu Ser His Thr Glu Met Pro Gly Thr
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Leu Gln Ala Ala Asp Ala Ala Ile Lys Lys Leu Glu Asp Phe Met
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Ser Thr Met Asp Ala Asn Gly Glu Arg Ile Arg Gly Leu Leu Glu
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Ala Gly Arg Gln Leu Val Ser Lys Gly Asn Ile His Ala Glu Lys
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Ile Gln Glu Lys Ala Asp Ser Ile Glu Lys Arg His Arg Lys Asn
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Gln Glu Ala Val Gln Gln Leu Leu Gly Arg Leu Arg Asp Asn Arg
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Glu Gln Gln His Phe Leu Gln Asp Cys Gln Glu Leu Lys Leu Trp
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Ile Asp Glu Lys Met Leu Thr Ala Gln Asp Val Ser Tyr Asp Glu
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Ala Arg Asn Leu His Thr Lys Trp Gln Lys His Gln Ala Phe Met
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Ala Glu Leu Ala Ala Asn Lys Asp Trp Leu Asp Lys Val Asp Lys
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Glu Gly Arg Glu Leu Thr Leu Glu Lys Pro Glu Leu Lys Val Leu
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Val Ser Glu Lys Leu Glu Asp Leu His Arg Arg Trp Asp Glu Leu
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Glu Thr Thr Thr Gln Ala Lys Ala Arg Ser Leu Phe Asp Ala Asn
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Arg Ala Glu Leu Phe Ala Gln Ser Cys Ser Ala Leu Glu Ser Trp
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Leu Glu Ser Leu Gln Ala Gln Leu His Ser Asp Asp Tyr Gly Lys
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Asp Leu Thr Ser Val Asn Ile Leu Leu Lys Lys Gln Gln Met Leu
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Glu Arg Glu Met Ala Val Arg Glu Lys Glu Val Glu Ala Ile Gln
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Ala Gln Ala Lys Ala Leu Ala Gln Glu Asp Gln Ser Ala Gly Glu
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Val Glu Arg Thr Ser Arg Ala Val Glu Glu Lys Phe Arg Ala Leu
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Cys Gln Pro Met Lys Asp Arg Cys Arg Arg Leu Gln Ala Ser Arg
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Glu Gln His Gln Phe His Arg Asp Val Glu Asp Glu Ile Leu Trp
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Val Thr Glu Arg Leu Pro Met Ala Ser Ser Leu Glu His Gly Lys
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Asp Leu Pro Ser Val Gln Leu Leu Met Lys Lys Asn Gln Thr Leu
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Gln Lys Glu Ile Gln Gly His Glu Pro Arg Ile Ala Asp Leu Lys
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Glu Arg Gln Arg Thr Leu Arg Thr Ala Ala Ala Gly Pro Glu Leu
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Ala Glu Leu Gln Glu Met Trp Lys Arg Leu Ser His Glu Leu Glu
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Leu Arg Gly Lys Arg Leu Glu Glu Ala Leu Arg Ala Gln Gln Phe
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Tyr Arg Asp Ala Ala Glu Ala Glu Ala Trp Met Gly Glu Gln Glu
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Leu His Met Met Gly Gln Glu Lys Ala Lys Asp Glu Leu Ser Ala
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Gln Ala Glu Val Lys Lys His Gln Val Leu Glu Gln Ala Leu Ala
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Asp Tyr Ala Gln Thr Ile Lys Gln Leu Ala Ala Ser Ser Gln Asp
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Met Ile Asp His Glu His Pro Glu Ser Thr Arg Leu Thr Ile Arg
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Gln Ala Gln Val Asp Lys Leu Tyr Ala Gly Leu Lys Glu Leu Ala

1670

1675

1680

Gly Glu Arg Arg Glu Arg Leu Gln Glu His Leu Arg Leu Cys Gln
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Leu Arg Arg Glu Leu Asp Asp Leu Glu Gln Trp Ile Gln Glu Arg
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Glu Val Val Ala Ala Ser His Glu Leu Gly Gln Asp Tyr Glu His
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Val Thr Met Leu Arg Asp Lys Phe Arg Glu Phe Ser Arg Asp Thr
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Ser Thr Ile Gly Gln Glu Arg Val Asp Ser Ala Asn Ala Leu Ala
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Asn Gly Leu Ile Ala Gly Gly His Ala Ala Trp Ala Thr Val Ala
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Glu Trp Lys Asp Ser Leu Asn Glu Ala Trp Ala Asp Leu Leu Glu
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Leu Leu Asp Thr Arg Gly Gln Val Leu Ala Ala Ala Tyr Glu Leu
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Gln Arg Phe Leu His Gly Ala Arg Gln Ala Leu Ala Arg Val Gln
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His Lys Gln Gln Leu Pro Asp Gly Thr Gly Arg Asp Leu Asn
 1820 1825 1830

Ala Ala Glu Ala Leu Gln Arg Arg His Cys Ala Tyr Glu His Asp
 1835 1840 1845

Ile Gln Ala Leu Ser Thr Gln Val Gln Gln Val Gln Asp Asp Gly
 1850 1855 1860

Leu Arg Leu Gln Lys Ala Tyr Ala Gly Asp Lys Ala Glu Glu Ile
 1865 1870 1875

Gly Arg His Met Gln Ala Val Ala Glu Ala Trp Ala Gln Leu Gln
 1880 1885 1890

Gly Ser Ser Ala Ala Arg Arg Gln Leu Leu Leu Asp Thr Thr Asp
 1895 1900 1905

Lys Phe Arg Phe Phe Lys Ala Val Arg Glu Leu Met Leu Trp Met
 1910 1915 1920

Asp Gly Ile Asn Leu Gln Met Asp Ala Gln Glu Arg Pro Arg Asp
 1925 1930 1935

Val Ser Ser Ala Asp Leu Val Ile Lys Asn Gln Gln Gly Ile Lys
 1940 1945 1950

Ala Glu Ile Glu Ala Arg Ala Asp Arg Phe Ser Ala Cys Ile Asp
 1955 1960 1965

Met Gly Gln Glu Leu Leu Ala Arg Asn His Tyr Ala Ala Glu Glu
 1970 1975 1980

Ile Ser Glu Lys Leu Ser Gln Leu Gln Ser Arg Arg Gln Glu Thr
 1985 1990 1995

Ala Glu Lys Trp Gln Glu Lys Met Asp Trp Leu Gln Leu Val Leu
 2000 2005 2010

Glu Val Leu Val Phe Gly Arg Asp Ala Gly Met Ala Glu Ala Trp
 2015 2020 2025

Leu Cys Ser Gln Glu Pro Leu Val Arg Ser Ala Glu Leu Gly Cys
 2030 2035 2040

Thr Val Asp Glu Val Glu Ser Leu Ile Lys Arg His Glu Ala Phe
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Gln Lys Ser Ala Val Ala Trp Glu Glu Arg Phe Ser Ala Leu Glu
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Lys Leu Thr Ala Leu Glu Glu Arg Glu Asn Glu Gln Lys Arg Lys
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Arg Glu Glu Glu Glu Arg Arg Lys Gln Pro Pro Thr Ser Glu Pro
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Ser Gln Pro Leu Leu Glu Gln Gln Arg Leu Glu Gln Ser Asn Val
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Pro Glu Gly Pro Gly Ser Gly Thr Gly Asp Glu Ser Ser Gly Pro
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Arg Gly Glu Arg Gln Thr Leu Pro Arg Gly Pro Ala Pro Ser Pro
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Pro Tyr His Gly Glu Val Pro Val Ser Leu Ala Arg Ala Gln Gly
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Gly Leu Gln Asp Gly Lys Glu Tyr Leu Phe Gln Ala Lys Asp Glu
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Ala Glu Met Ser Ser Trp Leu Arg Val Val Asn Ala Ala Ile Ala
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Gln Ser His Leu Ser Ser Pro Ile Ala Ser Trp Leu Ser Ser Leu Ser
          20          25          30

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tct ctg gga gat tct aca cct gaa cgc aca tcc cct tct cac cac cac cgc 144
 Ser Leu Gly Asp Ser Thr Pro Glu Arg Thr Ser Pro Ser His His Arg
 35 40 45

cag ccc tct gac act tct gag aca aca gca ggt ctt gtt cag cgc tgt 192
 Gln Pro Ser Asp Thr Ser Glu Thr Thr Ala Gly Leu Val Gln Arg Cys
 50 55 60

gtc atc atc caa aag gac cag cat ggc ttt ggc ttc aca gtt agt gga 240
 Val Ile Ile Gln Lys Asp Gln His Gly Phe Gly Phe Thr Val Ser Gly
 65 70 75 80

gat cgc att gta ctg gtg cag tcc gtg cgc cct gga ggc gca gca gcc atg 288
 Asp Arg Ile Val Leu Val Gln Ser Val Arg Pro Gly Gly Ala Ala Met
 85 90 95

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aaa gct ggt gtg aaa gag ggt gac cgg atc atc aaa gta aac ggc acc 336
Lys Ala Gly Val Lys Glu Gly Asp Arg Ile Ile Lys Val Asn Gly Thr
100          105          110

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atg gtg acc aat agc tca cac ctg gag gtg gta aag ctt atc aaa tct 384
 Met Val Thr Asn Ser Ser His Leu Glu Val Val Lys Leu Ile Lys Ser
 115 120 125

ggc gcc tat gct gcg ctt acc ctc cta ggc tct tct cct ccc tcc gtc 432
Gly Ala Tyr Ala Ala Leu Thr Leu Leu Gly Ser Ser Pro Pro Ser Val
130 135 140

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ggc gtc tct ggg ctc cag cag aat cca tct gtg gca gga gtg ctc aga 480
Gly Val Ser Gly Leu Gln Gln Asn Pro Ser Val Ala Gly Val Leu Arg
145           150           155           160

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gtt aac ccc atc att cct cca cca cct ccc ccg cca ccc ttg cca cct 528
Val Asn Pro Ile Ile Pro Pro Pro Pro Pro Pro Pro Pro Leu Pro Pro

165	170	175	
cca cag cac att act gga ccc aaa cct ctt cag gat cct gaa gtc caa Pro Gln His Ile Thr Gly Pro Lys Pro Leu Gln Asp Pro Glu Val Gln 180	185	190	576
aag cac gcc actcaa atc ctc tgg aat atg cta aga cag gag gag gaa Lys His Ala Thr Gln Ile Leu Trp Asn Met Leu Arg Gln Glu Glu Glu 195	200	205	624
gag tta cag gac ata ctt cca ccc tgt ggt gag acc agt cag aga aca Glu Leu Gln Asp Ile Leu Pro Pro Cys Gly Glu Thr Ser Gln Arg Thr 210	215	220	672
tgt gag ggc cgc ctc tct gtg gac tcc cag gag gca gac agt ggc ttg Cys Glu Gly Arg Leu Ser Val Asp Ser Gln Glu Ala Asp Ser Gly Leu 225	230	235	720
gat tct ggg aca gaa cgc ttt ccc tcc atc agt gag tca ttg atg aat Asp Ser Gly Thr Glu Arg Phe Pro Ser Ile Ser Glu Ser Leu Met Asn 245	250	255	768
cgg aac tca gta ttg tca gat cct gga cta gac agc cct caa acc tcc Arg Asn Ser Val Leu Ser Asp Pro Gly Leu Asp Ser Pro Gln Thr Ser 260	265	270	816
cct gta atc ctg gcc agg gtg gcc cag cac cac agg cga cag ggc tca Pro Val Ile Leu Ala Arg Val Ala Gln His His Arg Arg Gln Gly Ser 275	280	285	864
gat gca gcg ttg ctc ccg ctc aac cac cag ggt ata gat caa agc cca Asp Ala Ala Leu Leu Pro Leu Asn His Gln Gly Ile Asp Gln Ser Pro 290	295	300	912
aag cct ctg att att ggc cca gag gaa gat tat gac cca ggt tat ttc Lys Pro Leu Ile Ile Gly Pro Glu Glu Asp Tyr Asp Pro Gly Tyr Phe 305	310	315	960
aac aat gag agt gac atc atc ttc caa gat ctt gaa aaa ctg aag tca Asn Asn Glu Ser Asp Ile Ile Phe Gln Asp Leu Glu Lys Leu Lys Ser 325	330	335	1008
cat cca gct tac ttg gta gtt ttt cta cgt tac atc ctc tct cag gca His Pro Ala Tyr Leu Val Val Phe Leu Arg Tyr Ile Leu Ser Gln Ala 340	345	350	1056
gac cct ggc ccc ctg ctt ttt tat ttg tgt tca gaa gtt tat caa cag Asp Pro Gly Pro Leu Leu Phe Tyr Leu Cys Ser Glu Val Tyr Gln Gln 355	360	365	1104
aca aat ccc aaa gat tcc cga agt ctg ggg aaa gac atc tgg aac att Thr Asn Pro Lys Asp Ser Arg Ser Leu Gly Lys Asp Ile Trp Asn Ile 370	375	380	1152
tcc ctg gag aaa aat gcg cct ctc aga gtg aag atc cct gag atg ttg Phe Leu Glu Lys Asn Ala Pro Leu Arg Val Lys Ile Pro Glu Met Leu 385	390	395	1200
cag gct gaa att gac cta cgc ctg cgg aac aat gag gac cct cgc aat Gln Ala Glu Ile Asp Leu Arg Leu Arg Asn Asn Glu Asp Pro Arg Asn 405	410	415	1248

gtg ctc tgt gaa gct cag gag gca gtc atg ctg gaa atc cag gag cag Val Leu Cys Glu Ala Gln Glu Ala Val Met Leu Glu Ile Gln Glu Gln 420 425 430	1296
atc aac gac tac aga tcc aag cgt act ctg ggc ctg ggc agc ctc tat Ile Asn Asp Tyr Arg Ser Lys Arg Thr Leu Gly Leu Gly Ser Leu Tyr 435 440 445	1344
ggt gaa aat gac ctg cta ggc ctg gat ggg gac cct ctt cga gaa cgc Gly Glu Asn Asp Leu Leu Gly Leu Asp Gly Asp Pro Leu Arg Glu Arg 450 455 460	1392
caa atg gct gag aag cag ctg gct gcc ctt gga gat atc ttg tcc aaa Gln Met Ala Glu Lys Gln Leu Ala Ala Leu Gly Asp Ile Leu Ser Lys 465 470 475 480	1440
tat gag gaa gat cgg agt gcc ccc atg gac ttt gct gtt aat acc ttt Tyr Glu Glu Asp Arg Ser Ala Pro Met Asp Phe Ala Val Asn Thr Phe 485 490 495	1488
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gca gaa aag acc cag tct gcc cct gac aag gac aag tgg ctg ccc ttc Ala Glu Lys Thr Gln Ser Ala Pro Asp Lys Asp Lys Trp Leu Pro Phe 515 520 525	1584
ttc cct aag acc aag aag cag agc agc aat tcc aag aaa gaa aag gat Phe Pro Lys Thr Lys Lys Gln Ser Ser Asn Ser Lys Lys Glu Lys Asp 530 535 540	1632
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ccc aag agc tcc tct cag agc att aag cca ggc aat gtg agg aac atc Pro Lys Ser Ser Gln Ser Ile Lys Pro Gly Asn Val Arg Asn Ile 565 570 575	1728
att cag cac ttt gag aac agc cat cag tat gat gtc cca gag ccg ggg Ile Gln His Phe Glu Asn Ser His Gln Tyr Asp Val Pro Glu Pro Gly 580 585 590	1776
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gac agt tcg cgc tca gag att cga ctg ggc cgc tct ggg agc ctc aag Asp Ser Ser Arg Ser Glu Ile Arg Leu Gly Arg Ser Gly Ser Leu Lys 610 615 620	1872
ggc cgg gaa gag atg aag cga tcc cgg aaa gca gag aac gtg ccc cgg Gly Arg Glu Glu Met Lys Arg Ser Arg Lys Ala Glu Asn Val Pro Arg 625 630 635 640	1920
cct cga agt gac gtt gac atg gat gct gct gca gag gct gcc cgc ctt Pro Arg Ser Asp Val Asp Met Asp Ala Ala Ala Glu Ala Ala Arg Leu 645 650 655	1968

cac cag tca gcc tcg tcc tct gcc tcc agc ctc tcc acc agg tct ctt		2016
His Gln Ser Ala Ser Ser Ala Ser Ser Leu Ser Thr Arg Ser Leu		
660	665	670
gag aac cca acc cct ccc ttc acc ccc aaa atg ggc cgc agg agc att		2064
Glu Asn Pro Thr Pro Pro Phe Thr Pro Lys Met Gly Arg Arg Ser Ile		
675	680	685
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Glu Ser Pro Asn Leu Gly Phe Cys Thr Asp Val Ile Leu Pro His Leu		
690	695	700
ctg gag gat gat ctg ggc caa ttg tct gac ctg gag cca gag cca gag		2160
Leu Glu Asp Asp Leu Gly Gln Leu Ser Asp Leu Glu Pro Glu Pro Glu		
705	710	715
720		
gtc caa aac tgg cag cat aca gta ggc aag gat gtg gtg gcc aac ctg		2208
Val Gln Asn Trp Gln His Thr Val Gly Lys Asp Val Val Ala Asn Leu		
725	730	735
acc cag agg gaa att gac cgg caa gag gtc atc aat gag ctt ttt gtg		2256
Thr Gln Arg Glu Ile Asp Arg Gln Glu Val Ile Asn Glu Leu Phe Val		
740	745	750
aca gaa gca tct cac ctg cgc aca ctc cga gtc ctg gac ctc atc ttc		2304
Thr Glu Ala Ser His Leu Arg Thr Leu Arg Val Leu Asp Leu Ile Phe		
755	760	765
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Tyr Gln Arg Met Arg Lys Glu Asn Leu Met Pro Arg Glu Glu Leu Ala		
770	775	780
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Arg Leu Phe Pro Asn Leu Pro Glu Leu Ile Glu Ile His Asn Ser Trp		
785	790	795
800		
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Cys Glu Ala Met Lys Lys Leu Arg Glu Glu Gly Pro Ile Ile Arg Asp		
805	810	815
atc agt gac ccc atg ctg gct cgg ttt gat ggt cct gcc cga gaa gaa		2496
Ile Ser Asp Pro Met Leu Ala Arg Phe Asp Gly Pro Ala Arg Glu Glu		
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ctc cag caa gta gct gca caa ttc tgt tcc tat cag tca gta gcc cta		2544
Leu Gln Gln Val Ala Ala Gln Phe Cys Ser Tyr Gln Ser Val Ala Leu		
835	840	845
gag cta atc agg act aag caa cgt aag gag agt cgg ttc cag ctc ttc		2592
Glu Leu Ile Arg Thr Lys Gln Arg Lys Glu Ser Arg Phe Gln Leu Phe		
850	855	860
atg cag gag gct gag agc cac cct cag tgc cgg cgt ctg cag ctc cga		2640
Met Gln Glu Ala Glu Ser His Pro Gln Cys Arg Arg Leu Gln Leu Arg		
865	870	875
880		
gac ctc atc gtc tct gaa atg caa cgg ctc acc aag tac cca ctg ctg		2688
Asp Leu Ile Val Ser Glu Met Gln Arg Leu Thr Lys Tyr Pro Leu Leu		
885	890	895
cta gag aac atc atc aag cac aca gag ggt ggc acc tct gag cat gag		2736

Leu	Glu	Asn	Ile	Ile	Lys	His	Thr	Glu	Gly	Gly	Thr	Ser	Glu	His	Glu	
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aag ctc tgc cgt gcc cgg gac cag tgc cgg gag att ctc aag ttt gtg															2784	
Lys	Leu	Cys	Arg	Ala	Arg	Asp	Gln	Cys	Arg	Glu	Ile	Leu	Lys	Phe	Val	
915								920					925			
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Asn	Glu	Ala	Val	Lys	Gln	Thr	Glu	Asn	Arg	His	Arg	Leu	Glu	Gly	Tyr	
930								935					940			
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Gln	Lys	Arg	Leu	Asp	Ala	Thr	Ala	Leu	Glu	Arg	Ala	Ser	Asn	Pro	Leu	
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gca gca gag ttc aag agc ctg gat ctt aca aca agg aag atg atc cac															2928	
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965								970					975			
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Glu	Gly	Pro	Leu	Thr	Trp	Arg	Ile	Ser	Lys	Asp	Lys	Thr	Leu	Asp	Leu	
980								985					990			
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Gln	Val	Leu	Leu	Leu	Glu	Asp	Leu	Val	Val	Leu	Leu	Gln	Arg	Gln	Glu	
995								1000					1005			
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Glu	Arg	Leu	Leu	Leu	Lys	Cys	His	Ser	Lys	Thr	Ala	Val	Gly	Ser		
1010								1015					1020			
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Ser	Asp	Ser	Lys	Gln	Thr	Phe	Ser	Pro	Val	Leu	Lys	Leu	Asn	Ala		
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Val	Leu	Ile	Arg	Ser	Val	Ala	Thr	Asp	Lys	Arg	Ala	Phe	Phe	Ile		
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Ile	Cys	Thr	Ser	Glu	Leu	Gly	Pro	Pro	Gln	Ile	Tyr	Glu	Leu	Val		
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Ala	Leu	Thr	Ser	Ser	Asp	Lys	Asn	Ile	Trp	Met	Glu	Leu	Leu	Glu		
1070								1075					1080			
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Glu	Ala	Val	Gln	Asn	Ala	Thr	Lys	His	Pro	Gly	Ala	Ala	Pro	Ile		
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Pro	Ile	His	Pro	Ser	Pro	Pro	Gly	Ser	Gln	Glu	Pro	Ala	Tyr	Gln		
1100								1105					1110			
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Gly	Ser	Thr	Ser	Ser	Arg	Val	Glu	Ile	Asn	Asp	Ser	Glu	Val	Tyr		
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His	Thr	Glu	Lys	Glu	Pro	Lys	Lys	Leu	Pro	Glu	Gly	Pro	Gly	Pro		

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Val Gln Glu Glu Asp Glu Glu	Glu Leu Arg Thr Leu	Pro Arg Ala	
1160	1165	1170	
ccc ccc tcc ctg gat gga gaa	aac aga ggc atc agg	aca agg gac	3564
Pro Pro Ser Leu Asp Gly Glu	Asn Arg Gly Ile Arg	Thr Arg Asp	
1175	1180	1185	
cct gtc ctt ctg gcc ctc aca	ggc cct ctg ctc atg	gag gga ctt	3609
Pro Val Leu Leu Ala Leu Thr	Gly Pro Leu Leu Met	Glu Gly Leu	
1190	1195	1200	
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1205	1210	1215	
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Leu Trp Ser Leu Leu Pro Gly	His Thr Val Lys Thr	Gln Ala Ala	
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ggc gag cct gag gat gac ctc	aca ccc acc cct tct	gtc gtg agc	3744
Gly Glu Pro Glu Asp Asp Leu	Thr Pro Thr Pro Ser	Val Val Ser	
1235	1240	1245	
atc acc tct cac ccc tgg gac	cca ggg tcc cca ggg	caa gct ccc	3789
Ile Thr Ser His Pro Trp Asp	Pro Gly Ser Pro Gly	Gln Ala Pro	
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Thr Ile Ser Asp Ser Thr Arg	Leu Ala Arg Pro Glu	Gly Ser Gln	
1265	1270	1275	
cca gag ggc gag gat gtt gct	gtc agt tct ctg gca	cac ctg ccg	3879
Pro Glu Gly Glu Asp Val Ala	Val Ser Ser Leu Ala	His Leu Pro	
1280	1285	1290	
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Pro Arg Thr Arg Ser Ser Gly	Val Trp Asp Ser Pro	Glu Leu Asp	
1295	1300	1305	
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Arg Asn Pro Ala Ala Glu Ala	Ala Ser Thr Glu Pro	Ala Ala Ser	
1310	1315	1320	
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Tyr Lys Val Val Arg Lys Val	Ser Leu Leu Pro Gly	Gly Gly Val	
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ggt gca gcc aag gtg gcg ggc	agc aat gct atc cct	gac agt ggc	4059
Gly Ala Ala Lys Val Ala Gly	Ser Asn Ala Ile Pro	Asp Ser Gly	
1340	1345	1350	
cag tca gaa tct gag cta tct	gaa gtg gaa ggc gga	gca cag gct	4104
Gln Ser Glu Ser Glu Leu Ser	Glu Val Glu Gly Gly	Ala Gln Ala	
1355	1360	1365	

acg ggg aac tgt ttc tat gtc	1370	1375	1380	4149
Thr Gly Asn Cys Phe Tyr Val				
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Ser Ser Thr Glu Pro Thr Gly				
cac agc ctc cct gca tgg cca	1400	1405	1410	4239
His Ser Leu Pro Ala Trp Pro				
gtc cgt ggg ggt cag tgt tcc	1415	1420	1425	4284
Val Arg Gly Gly Gln Cys Ser				
gtg atc ttc cat acc atc gag	1430	1435	1440	4329
Val Ile Phe His Thr Ile Glu				
ctg aag gac atg gag ctg gcc	1445	1450	1455	4374
Leu Lys Asp Met Glu Leu Ala				
gga gga gag tca tcg ggt gga	1460	1465	1470	4419
Gly Gly Glu Ser Ser Gly Gly				
aca gag gca gcc aga tgg aca	1475	1480	1485	4464
Thr Glu Ala Ala Arg Trp Thr				
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Lys Glu Ala Leu Ala Ser Asp				
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 35 40 45

Gln Pro Ser Asp Thr Ser Glu Thr Thr Ala Gly Leu Val Gln Arg Cys
 50 55 60

Val Ile Ile Gln Lys Asp Gln His Gly Phe Gly Phe Thr Val Ser Gly
 65 70 75 80

Asp Arg Ile Val Leu Val Gln Ser Val Arg Pro Gly Gly Ala Ala Met
 85 90 95

Lys Ala Gly Val Lys Glu Gly Asp Arg Ile Ile Lys Val Asn Gly Thr
 100 105 110

Met Val Thr Asn Ser Ser His Leu Glu Val Val Lys Leu Ile Lys Ser
 115 120 125

Gly Ala Tyr Ala Ala Leu Thr Leu Leu Gly Ser Ser Pro Pro Ser Val
 130 135 140

Gly Val Ser Gly Leu Gln Gln Asn Pro Ser Val Ala Gly Val Leu Arg
 145 150 155 160

Val Asn Pro Ile Ile Pro Pro Pro Pro Pro Pro Pro Leu Pro Pro
 165 170 175

Pro Gln His Ile Thr Gly Pro Lys Pro Leu Gln Asp Pro Glu Val Gln
 180 185 190

Lys His Ala Thr Gln Ile Leu Trp Asn Met Leu Arg Gln Glu Glu Glu
 195 200 205

Glu Leu Gln Asp Ile Leu Pro Pro Cys Gly Glu Thr Ser Gln Arg Thr
 210 215 220

Cys Glu Gly Arg Leu Ser Val Asp Ser Gln Glu Ala Asp Ser Gly Leu
 225 230 235 240

Asp Ser Gly Thr Glu Arg Phe Pro Ser Ile Ser Glu Ser Leu Met Asn
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Arg Asn Ser Val Leu Ser Asp Pro Gly Leu Asp Ser Pro Gln Thr Ser
 260 265 270

Pro Val Ile Leu Ala Arg Val Ala Gln His His Arg Arg Gln Gly Ser

275

280

285

Asp Ala Ala Leu Leu Pro Leu Asn His Gln Gly Ile Asp Gln Ser Pro
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Lys Pro Leu Ile Ile Gly Pro Glu Glu Asp Tyr Asp Pro Gly Tyr Phe
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Asn Asn Glu Ser Asp Ile Ile Phe Gln Asp Leu Glu Lys Leu Lys Ser
 325 330 335

His Pro Ala Tyr Leu Val Val Phe Leu Arg Tyr Ile Leu Ser Gln Ala
 340 345 350

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 355 360 365

Thr Asn Pro Lys Asp Ser Arg Ser Leu Gly Lys Asp Ile Trp Asn Ile
 370 375 380

Phe Leu Glu Lys Asn Ala Pro Leu Arg Val Lys Ile Pro Glu Met Leu
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Gln Ala Glu Ile Asp Leu Arg Leu Arg Asn Asn Glu Asp Pro Arg Asn
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Val Leu Cys Glu Ala Gln Glu Ala Val Met Leu Glu Ile Gln Glu Gln
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Ile Asn Asp Tyr Arg Ser Lys Arg Thr Leu Gly Leu Gly Ser Leu Tyr
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Gly Glu Asn Asp Leu Leu Gly Leu Asp Gly Asp Pro Leu Arg Glu Arg
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Gln Met Ala Glu Lys Gln Leu Ala Ala Leu Gly Asp Ile Leu Ser Lys
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Tyr Glu Glu Asp Arg Ser Ala Pro Met Asp Phe Ala Val Asn Thr Phe
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Ala Glu Lys Thr Gln Ser Ala Pro Asp Lys Asp Lys Trp Leu Pro Phe
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Phe Pro Lys Thr Lys Lys Gln Ser Ser Asn Ser Lys Lys Glu Lys Asp
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Ala Leu Glu Asp Lys Lys Arg Asn Pro Ile Leu Arg Tyr Ile Gly Lys
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Pro Lys Ser Ser Ser Gln Ser Ile Lys Pro Gly Asn Val Arg Asn Ile
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Ile Gln His Phe Glu Asn Ser His Gln Tyr Asp Val Pro Glu Pro Gly
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Thr Gln Arg Leu Ser Thr Gly Ser Phe Pro Glu Asp Leu Leu Glu Ser
 595 600 605

Asp Ser Ser Arg Ser Glu Ile Arg Leu Gly Arg Ser Gly Ser Leu Lys
 610 615 620

Gly Arg Glu Glu Met Lys Arg Ser Arg Lys Ala Glu Asn Val Pro Arg
 625 630 635 640

Pro Arg Ser Asp Val Asp Met Asp Ala Ala Ala Glu Ala Ala Arg Leu
 645 650 655

His Gln Ser Ala Ser Ser Ser Ala Ser Ser Leu Ser Thr Arg Ser Leu
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Glu Asn Pro Thr Pro Pro Phe Thr Pro Lys Met Gly Arg Arg Ser Ile
 675 680 685

Glu Ser Pro Asn Leu Gly Phe Cys Thr Asp Val Ile Leu Pro His Leu
 690 695 700

Leu Glu Asp Asp Leu Gly Gln Leu Ser Asp Leu Glu Pro Glu Pro Glu
 705 710 715 720

Val Gln Asn Trp Gln His Thr Val Gly Lys Asp Val Val Ala Asn Leu
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Thr Gln Arg Glu Ile Asp Arg Gln Glu Val Ile Asn Glu Leu Phe Val
 740 745 750

Thr Glu Ala Ser His Leu Arg Thr Leu Arg Val Leu Asp Leu Ile Phe
 755 760 765

Tyr Gln Arg Met Arg Lys Glu Asn Leu Met Pro Arg Glu Glu Leu Ala
 770 775 780

Arg Leu Phe Pro Asn Leu Pro Glu Leu Ile Glu Ile His Asn Ser Trp
 785 790 795 800

Cys Glu Ala Met Lys Lys Leu Arg Glu Glu Gly Pro Ile Ile Arg Asp
 805 810 815

Ile Ser Asp Pro Met Leu Ala Arg Phe Asp Gly Pro Ala Arg Glu Glu
 820 825 830

Leu Gln Gln Val Ala Ala Gln Phe Cys Ser Tyr Gln Ser Val Ala Leu
 835 840 845

Glu Leu Ile Arg Thr Lys Gln Arg Lys Glu Ser Arg Phe Gln Leu Phe
 850 855 860

Met Gln Glu Ala Glu Ser His Pro Gln Cys Arg Arg Leu Gln Leu Arg
 865 870 875 880

Asp Leu Ile Val Ser Glu Met Gln Arg Leu Thr Lys Tyr Pro Leu Leu
 885 890 895

Leu Glu Asn Ile Ile Lys His Thr Glu Gly Gly Thr Ser Glu His Glu
 900 905 910

Lys Leu Cys Arg Ala Arg Asp Gln Cys Arg Glu Ile Leu Lys Phe Val
 915 920 925

Asn Glu Ala Val Lys Gln Thr Glu Asn Arg His Arg Leu Glu Gly Tyr
 930 935 940

Gln Lys Arg Leu Asp Ala Thr Ala Leu Glu Arg Ala Ser Asn Pro Leu
 945 950 955 960

Ala Ala Glu Phe Lys Ser Leu Asp Leu Thr Thr Arg Lys Met Ile His
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Glu Gly Pro Leu Thr Trp Arg Ile Ser Lys Asp Lys Thr Leu Asp Leu
 980 985 990

Gln Val Leu Leu Leu Glu Asp Leu Val Val Leu Leu Gln Arg Gln Glu
 995 1000 1005

Glu Arg Leu Leu Leu Lys Cys His Ser Lys Thr Ala Val Gly Ser
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Ser Asp Ser Lys Gln Thr Phe Ser Pro Val Leu Lys Leu Asn Ala
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Val Leu Ile Arg Ser Val Ala Thr Asp Lys Arg Ala Phe Phe Ile
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Ile Cys Thr Ser Glu Leu Gly Pro Pro Gln Ile Tyr Glu Leu Val
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Ala Leu Thr Ser Ser Asp Lys Asn Ile Trp Met Glu Leu Leu Glu
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Glu Ala Val Gln Asn Ala Thr Lys His Pro Gly Ala Ala Pro Ile
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Pro Ile His Pro Ser Pro Pro Gly Ser Gln Glu Pro Ala Tyr Gln
 1100 1105 1110

Gly Ser Thr Ser Ser Arg Val Glu Ile Asn Asp Ser Glu Val Tyr
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His Thr Glu Lys Glu Pro Lys Lys Leu Pro Glu Gly Pro Gly Pro
 1130 1135 1140

Glu Gln Arg Val Gln Asp Lys Gln Leu Ile Ala Gln Gly Glu Pro
 1145 1150 1155

Val Gln Glu Glu Asp Glu Glu Glu Leu Arg Thr Leu Pro Arg Ala
 1160 1165 1170

Pro Pro Ser Leu Asp Gly Glu Asn Arg Gly Ile Arg Thr Arg Asp
 1175 1180 1185

Pro Val Leu Leu Ala Leu Thr Gly Pro Leu Leu Met Glu Gly Leu
 1190 1195 1200

Ala Asp Ala Ala Leu Glu Asp Val Glu Asn Leu Arg His Leu Ile
 1205 1210 1215

Leu Trp Ser Leu Leu Pro Gly His Thr Val Lys Thr Gln Ala Ala
 1220 1225 1230

Gly Glu Pro Glu Asp Asp Leu Thr Pro Thr Pro Ser Val Val Ser

1235

1240

1245

Ile Thr Ser His Pro Trp Asp Pro Gly Ser Pro Gly Gln Ala Pro
 1250 1255 1260

Thr Ile Ser Asp Ser Thr Arg Leu Ala Arg Pro Glu Gly Ser Gln
 1265 1270 1275

Pro Glu Gly Glu Asp Val Ala Val Ser Ser Leu Ala His Leu Pro
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Pro Arg Thr Arg Ser Ser Gly Val Trp Asp Ser Pro Glu Leu Asp
 1295 1300 1305

Arg Asn Pro Ala Ala Glu Ala Ala Ser Thr Glu Pro Ala Ala Ser
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Tyr Lys Val Val Arg Lys Val Ser Leu Leu Pro Gly Gly Gly Val
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Thr Gly Asn Cys Phe Tyr Val Ser Met Pro Ala Gly Pro Leu Asp
 1370 1375 1380

Ser Ser Thr Glu Pro Thr Gly Thr Pro Pro Ser Pro Ser Gln Cys
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His Ser Leu Pro Ala Trp Pro Thr Glu Pro Gln Pro Tyr Arg Gly
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Val Arg Gly Gly Gln Cys Ser Ser Leu Val Arg Arg Asp Val Asp
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Val Ile Phe His Thr Ile Glu Gln Leu Thr Ile Lys Leu His Arg
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Gly Gly Glu Ser Ser Gly Gly Thr Thr Pro Val Gly Ser Phe His
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Thr Glu Ala Ala Arg Trp Thr Asp Tyr Ser Leu Ser Pro Pro Ala
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Lys Glu Ala Leu Ala Ser Asp Ser Gln Asn Gly Gln Glu Gln Gly
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48

ggc tct gat cgt ttc gca ccg ccg gac ttc agg gat ata tcc aaa tgg
 Gly Ser Asp Arg Phe Ala Arg Pro Asp Phe Arg Asp Ile Ser Lys Trp
 20 25 30

96

aac aac cgt gta gtg agc aat ctg ctc tat tac cag acc aac tac ctg
 Asn Asn Arg Val Val Ser Asn Leu Leu Tyr Tyr Gln Thr Asn Tyr Leu
 35 40 45

144

gtg gtg gct gcc atg atg att tca gtc gtt ggg ttt ctg agc ccc ttc
 Val Val Ala Ala Met Met Ile Ser Val Val Gly Phe Leu Ser Pro Phe
 50 55 60

192

aac atg atc ctt gga gga atc att gtg gtg ctg gtg ttc acg ggg ttt
 Asn Met Ile Leu Gly Gly Ile Ile Val Val Leu Val Phe Thr Gly Phe
 65 70 75 80

240

gtg tgg gca gca cac aat aaa gac atc ctc cgc ccg atg aag aag cag
 Val Trp Ala Ala His Asn Lys Asp Ile Leu Arg Arg Met Lys Lys Gln
 85 90 95

288

tac cca acg gcc ttt gtc atg gtg gtc atg cta gcc agc tac ttc ctc
 Tyr Pro Thr Ala Phe Val Met Val Val Met Leu Ala Ser Tyr Phe Leu
 100 105 110

336

ata tcc atg ttt ggg ggt gtc atg gtc ttt gtg ttt ggc atc acg ttt
 Ile Ser Met Phe Gly Gly Val Met Val Phe Val Phe Gly Ile Thr Phe
 115 120 125

384

ccc tta ttg ttg atg ttc atc cat gca tcc ctg aga ctt cga aac ctc	130	135	140	432
Pro Leu Leu Leu Met Phe Ile His Ala Ser Leu Arg Leu Arg Asn Leu				
aag aac aaa ctg gaa aat aaa atg gag gga ata ggc ttg aag aaa acg	145	150	155	480
Lys Asn Lys Leu Glu Asn Lys Met Glu Gly Ile Gly Leu Lys Lys Thr				
ccg atg ggc atc atc ctg gat gcc ttg gaa cag cag gaa gac agc atc	165	170	175	528
Pro Met Gly Ile Ile Leu Asp Ala Leu Glu Gln Gln Glu Asp Ser Ile				
aat aaa ttt gct gac tac atc agc aaa gcc agg gag taa	180	185		567
Asn Lys Phe Ala Asp Tyr Ile Ser Lys Ala Arg Glu				
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Met Asp Val Asn Leu Ala Pro Leu Arg Ala Trp Asp Asp Phe Phe Pro	1	5	10	15
Gly Ser Asp Arg Phe Ala Arg Pro Asp Phe Arg Asp Ile Ser Lys Trp	20	25	30	
Asn Asn Arg Val Val Ser Asn Leu Leu Tyr Tyr Gln Thr Asn Tyr Leu	35	40	45	
Val Val Ala Ala Met Met Ile Ser Val Val Gly Phe Leu Ser Pro Phe	50	55	60	
Asn Met Ile Leu Gly Gly Ile Ile Val Val Leu Val Phe Thr Gly Phe	65	70	75	80
Val Trp Ala Ala His Asn Lys Asp Ile Leu Arg Arg Met Lys Lys Gln	85	90	95	
Tyr Pro Thr Ala Phe Val Met Val Val Met Leu Ala Ser Tyr Phe Leu	100	105	110	
Ile Ser Met Phe Gly Gly Val Met Val Phe Val Phe Gly Ile Thr Phe	115	120	125	
Pro Leu Leu Leu Met Phe Ile His Ala Ser Leu Arg Leu Arg Asn Leu	130	135	140	
Lys Asn Lys Leu Glu Asn Lys Met Glu Gly Ile Gly Leu Lys Lys Thr				

145

150

155

160

Pro Met Gly Ile Ile Leu Asp Ala Leu Glu Gln Gln Glu Asp Ser Ile
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Asn Lys Phe Ala Asp Tyr Ile Ser Lys Ala Arg Glu
 180 185

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 accattaacc tacctctaca tccccctggc gccgttccag ggccaacgcc acattccctg 180
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 cgaggtcgcc atg gat cgg atg aag aag atc aaa cgg cag ctg tca atg 289
 Met Asp Arg Met Lys Lys Ile Lys Arg Gln Leu Ser Met
 1 5 10
 aca ctc cga ggg ggc cga ggc ata gac aag acc aat ggt gtc cct gag 337
 Thr Leu Arg Gly Gly Arg Gly Ile Asp Lys Thr Asn Gly Val Pro Glu
 15 20 25
 cag ata ggc cta gat gag agt ggt ggt ggt ggc atg acc ctt gga 385
 Gln Ile Gly Leu Asp Glu Ser Gly Gly Gly Gly Met Thr Leu Gly
 30 35 40 45
 gaa gct ccc acc cgt gtt gcc cct ggg gaa ctt cgc tct att cgg ggc 433
 Glu Ala Pro Thr Arg Val Ala Pro Gly Glu Leu Arg Ser Ile Arg Gly
 50 55 60
 cca ctc agc tct gca cca ggtctacctg gggttccctag tctgctctag 481
 Pro Leu Ser Ser Ala Pro
 65
 gggccatgta cacaaatgga tacgatgaag aaatataatta tattggggaa aagagagtgt 541
 tcttgactcc aaaggcctgg ctttccctc actctgcacc a gag att gtg cat gaa 597
 Glu Ile Val His Glu
 70

gac atg aag atg gga tct gat ggg gag agt gac cag gct tca gcc aca Asp Met Lys Met Gly Ser Asp Gly Glu Ser Asp Gln Ala Ser Ala Thr 75 80 85	645
tcc tca gat gag gtg cag tct cca gtg aga gtg cgc atg cgc aac cac Ser Ser Asp Glu Val Gln Ser Pro Val Arg Val Arg Met Arg Asn His 90 95 100	693
ccc cca cgc aag atc tcc act gag gat atc aac aaa tgc ctg tca cta Pro Pro Arg Lys Ile Ser Thr Glu Asp Ile Asn Lys Cys Leu Ser Leu 105 110 115 120	741
cca gct gac ata cgg ctg cct gag ggc tac ctt gag aag ctg acc ctc Pro Ala Asp Ile Arg Leu Pro Glu Gly Tyr Leu Glu Lys Leu Thr Leu 125 130 135	789
aat agc ccc atc ggt gat aag cct ctt agc cgg cgc ctc cgg cca gtc Asn Ser Pro Ile Gly Asp Lys Pro Leu Ser Arg Arg Leu Arg Pro Val 140 145 150	837
agc ttg tct gag att ggc ttt gga aaa ctg gag acc tac atc aaa cta Ser Leu Ser Glu Ile Gly Phe Gly Lys Leu Glu Thr Tyr Ile Lys Leu 155 160 165	885
gac aag ctg ggt gag ggt acc tat gcc act gtc tac aaa ggc aaa agc Asp Lys Leu Gly Glu Gly Thr Tyr Ala Thr Val Tyr Lys Gly Lys Ser 170 175 180	933
aag ctc aca gac aac ctt gta gca ctt aag gag atc aga ctg gaa cac Lys Leu Thr Asp Asn Leu Val Ala Leu Lys Glu Ile Arg Leu Glu His 185 190 195 200	981
gaa gaa ggg gca ccc tgc act gct atc cgg gaa gta tcc ctg ctt aag Glu Glu Gly Ala Pro Cys Thr Ala Ile Arg Glu Val Ser Leu Leu Lys 205 210 215	1029
gac ctc aag cat gcc aac atc gtc aca cta cat gac att atc cac aca Asp Leu Lys His Ala Asn Ile Val Thr Leu His Asp Ile Ile His Thr 220 225 230	1077
gag aag tcc ctc acc ctt gtc ttt gaa tac ttg gac aag gac ctg aag Glu Lys Ser Leu Thr Leu Val Phe Glu Tyr Leu Asp Lys Asp Leu Lys 235 240 245	1125
cag tac ctg gat gac tgt gga aat gtc atc aac atg cac aat gtg aaa Gln Tyr Leu Asp Asp Cys Gly Asn Val Ile Asn Met His Asn Val Lys 250 255 260	1173
ctg ttc ctg ttc cag ttg ctc cgt ggc ctg gcc tac tgc cac agg cag Leu Phe Leu Phe Gln Leu Leu Arg Gly Leu Ala Tyr Cys His Arg Gln 265 270 275 280	1221
aag gtg cta cac cga gac ctc aag ccc cag aac cta ctc atc aac gag Lys Val Leu His Arg Asp Leu Lys Pro Gln Asn Leu Leu Ile Asn Glu 285 290 295	1269
agg gga gag ctc aaa ctg gca gac ttt ggc ctg gct tac gcc aag tca Arg Gly Glu Leu Lys Leu Ala Asp Phe Gly Leu Ala Tyr Ala Lys Ser 300 305 310	1317
att cct act aaa aca tac tcc aac gaa gtg gtg aca ctg tgg tac cgg	1365

Ile Pro Thr Lys Thr Tyr Ser Asn Glu Val Val Thr Leu Trp Tyr Arg			
315	320	325	
ccc cct gac atc tta ctt ggg tcc aca gac tac tcc ggc caa att gac		1413	
Pro Pro Asp Ile Leu Leu Gly Ser Thr Asp Tyr Ser Gly Gln Ile Asp			
330	335	340	
atg tgg ggt gtt ggc tgc atc ttt tat gag atg gcc aca ggc cgg ccc		1461	
Met Trp Gly Val Gly Cys Ile Phe Tyr Glu Met Ala Thr Gly Arg Pro			
345	350	355	360
ctc ttc cca ggc tcc aca gtg gaa gaa cag ctg cac ttc atc ttc cgc		1509	
Leu Phe Pro Gly Ser Thr Val Glu Glu Gln Leu His Phe Ile Phe Arg			
365	370	375	
att ttg gga acc cca act gag gac aca tgg cca ggt atc ctg tcc aat		1557	
Ile Leu Gly Thr Pro Thr Glu Asp Thr Trp Pro Gly Ile Leu Ser Asn			
380	385	390	
gaa gag ttt aga aca tac aac tac ccc aag tac cga gcc gag gcc ctt		1605	
Glu Glu Phe Arg Thr Tyr Asn Tyr Pro Lys Tyr Arg Ala Glu Ala Leu			
395	400	405	
ctg agg cat gca ccc cga ctt gaa tgc gat gga gct gac ctc ctc acc		1653	
Leu Arg His Ala Pro Arg Leu Glu Cys Asp Gly Ala Asp Leu Leu Thr			
410	415	420	
aag ctg ctg cag ttt gag ggt cgc aat cgg atc tct gct gag gat gcc		1701	
Lys Leu Leu Gln Phe Glu Gly Arg Asn Arg Ile Ser Ala Glu Asp Ala			
425	430	435	440
atg aaa cat cca ttc ttt ctc agc ttg ggg gag cgg atc cac aaa ctt		1749	
Met Lys His Pro Phe Leu Ser Leu Gly Glu Arg Ile His Lys Leu			
445	450	455	
cct gac act act tcc ata ttt gca cta aag gag gta cag cta caa aag		1797	
Pro Asp Thr Thr Ser Ile Phe Ala Leu Lys Glu Val Gln Leu Gln Lys			
460	465	470	
gag gcc aac att cgg tcc act tct atg cct gac tca ggc agg cca gct		1845	
Glu Ala Asn Ile Arg Ser Thr Ser Met Pro Asp Ser Gly Arg Pro Ala			
475	480	485	
ttc cgt gtg gtg gat acc gag ttc taagccaagt tttaagccac agacagacca		1899	
Phe Arg Val Val Asp Thr Glu Phe			
490	495		
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<212> PRT

<213> Rattus norvegicus

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				20				25				30			

Leu	Asp	Glu	Ser	Gly	Gly	Gly	Met	Thr	Leu	Gly	Glu	Ala	Pro
				35			40				45		

Thr	Arg	Val	Ala	Pro	Gly	Glu	Leu	Arg	Ser	Ile	Arg	Gly	Pro	Leu	Ser
				50			55			60					

Ser	Ala	Pro	Glu	Ile	Val	His	Glu	Asp	Met	Lys	Met	Gly	Ser	Asp	Gly
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Glu	Ser	Asp	Gln	Ala	Ser	Ala	Thr	Ser	Ser	Asp	Glu	Val	Gln	Ser	Pro
				85			90			95					

Val Arg Val Arg Met Arg Asn His Pro Pro Arg Lys Ile Ser Thr Glu

100

105

110

Asp Ile Asn Lys Cys Leu Ser Leu Pro Ala Asp Ile Arg Leu Pro Glu
 115 120 125

Gly Tyr Leu Glu Lys Leu Thr Leu Asn Ser Pro Ile Gly Asp Lys Pro
 130 135 140

Leu Ser Arg Arg Leu Arg Pro Val Ser Leu Ser Glu Ile Gly Phe Gly
 145 150 155 160

Lys Leu Glu Thr Tyr Ile Lys Leu Asp Lys Leu Gly Glu Gly Thr Tyr
 165 170 175

Ala Thr Val Tyr Lys Gly Lys Ser Lys Leu Thr Asp Asn Leu Val Ala
 180 185 190

Leu Lys Glu Ile Arg Leu Glu His Glu Glu Gly Ala Pro Cys Thr Ala
 195 200 205

Ile Arg Glu Val Ser Leu Leu Lys Asp Leu Lys His Ala Asn Ile Val
 210 215 220

Thr Leu His Asp Ile Ile His Thr Glu Lys Ser Leu Thr Leu Val Phe
 225 230 235 240

Glu Tyr Leu Asp Lys Asp Leu Lys Gln Tyr Leu Asp Asp Cys Gly Asn
 245 250 255

Val Ile Asn Met His Asn Val Lys Leu Phe Leu Phe Gln Leu Leu Arg
 260 265 270

Gly Leu Ala Tyr Cys His Arg Gln Lys Val Leu His Arg Asp Leu Lys
 275 280 285

Pro Gln Asn Leu Leu Ile Asn Glu Arg Gly Glu Leu Lys Leu Ala Asp
 290 295 300

Phe Gly Leu Ala Tyr Ala Lys Ser Ile Pro Thr Lys Thr Tyr Ser Asn
 305 310 315 320

Glu Val Val Thr Leu Trp Tyr Arg Pro Pro Asp Ile Leu Leu Gly Ser
 325 330 335

Thr Asp Tyr Ser Gly Gln Ile Asp Met Trp Gly Val Gly Cys Ile Phe
 340 345 350

Tyr Glu Met Ala Thr Gly Arg Pro Leu Phe Pro Gly Ser Thr Val Glu
355 360 365

Glu Gln Leu His Phe Ile Phe Arg Ile Leu Gly Thr Pro Thr Glu Asp
370 375 380

Thr Trp Pro Gly Ile Leu Ser Asn Glu Glu Phe Arg Thr Tyr Asn Tyr
385 390 395 400

Pro Lys Tyr Arg Ala Glu Ala Leu Leu Arg His Ala Pro Arg Leu Glu
405 410 415

Cys Asp Gly Ala Asp Leu Leu Thr Lys Leu Leu Gln Phe Glu Gly Arg
420 425 430

Asn Arg Ile Ser Ala Glu Asp Ala Met Lys His Pro Phe Phe Leu Ser
435 440 445

Leu Gly Glu Arg Ile His Lys Leu Pro Asp Thr Thr Ser Ile Phe Ala
450 455 460

Leu Lys Glu Val Gln Leu Gln Lys Glu Ala Asn Ile Arg Ser Thr Ser
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Met Pro Asp Ser Gly Arg Pro Ala Phe Arg Val Val Asp Thr Glu Phe
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<210> 10
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<400> 10

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gagctgcaag aggctgagct gactctaccc agcctgggaa aaccctataa gtcactcatg 180
gcacaagcca agggggcatc aagggttcgg ggaggtaatg agagtgtcat gtga 234

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<212> PRT
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<400> 12

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Arg Thr Met Thr Asn Val Leu Gly Asp Ser Ile Gly Ala Ala Val Ile
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Glu His Leu Ser Gln Arg Glu Leu Glu Leu Gln Glu Ala Glu Leu Thr
35 40 45

Leu Pro Ser Leu Gly Lys Pro Tyr Lys Ser Leu Met Ala Gln Ala Lys
50 55 60

Gly Ala Ser Arg Gly Arg Gly Asn Glu Ser Val Met
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<211> 86
<212> PRT
<213> Artificial Sequence

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<400> 13

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20 25 30

Glu Gln Val Asp Val Ser Ser Glu Val Asn Ile Val Asn Pro Phe Ala
35 40 45

Leu Glu Pro Thr Ile Leu Asp Asn Glu Asp Ser Asp Thr Lys Lys Ser
50 55 60

Tyr Val Asn Gly Gly Phe Ser Val Asp Lys Ser Asp Thr Ile Ser Phe
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Thr Gln Thr Ser Gln Phe
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<213> Artificial Sequence

<220>

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<210> 15

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

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<210> 16

<211> 16

<212> PRT

<213> Artificial Sequence

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 Met Tyr Thr Asn Gly Tyr Asp Glu Glu Ile Tyr Tyr Ile Gly
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 Ala Pro Glu Ile Val His Glu Asp Met Lys Met Gly Ser Asp Gly Glu
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 Ser Asp Gln Ala Ser Ala Thr Ser Ser Asp Glu Val Gln Ser Pro Val
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 Arg Val Arg Met Arg Asn His Pro Pro Arg Lys Ile Ser Thr Glu Asp
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 Ile Asn Lys Cys Leu Ser Leu Pro Ala Asp Ile Arg Leu Pro Glu Gly
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 Tyr Leu Glu Lys Leu Thr Leu Asn Ser Pro Ile Gly Asp Lys Pro Leu
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 ctg gag acc tac atc aaa cta gac aag ctg ggt gag ggt acc tat gcc 912
 Leu Glu Thr Tyr Ile Lys Leu Asp Lys Leu Gly Glu Gly Thr Tyr Ala
 130 135 140

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Arg Glu Val Ser Leu Leu Lys Asp Leu Lys His Ala Asn Ile Val Thr	
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cta cat gac att atc cac aca gag aag tcc ctc acc ctt gtc ttt gaa	1104
Leu His Asp Ile Ile His Thr Glu Lys Ser Leu Thr Leu Val Phe Glu	
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Gln Asn Leu Leu Ile Asn Glu Arg Gly Glu Leu Lys Leu Ala Asp Phe	
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Trp Pro Gly Ile Leu Ser Asn Glu Glu Phe Arg Thr Tyr Asn Tyr Pro	
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Lys Tyr Arg Ala Glu Ala Leu Leu Arg His Ala Pro Arg Leu Glu Cys	
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Lys Glu Val Gln Leu Gln Lys Glu Ala Asn Ile Arg Ser Thr Ser Met			
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Pro Asp Ser Gly Arg Pro Ala Phe Arg Val Val Asp Thr Glu Phe			
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 115 120 125

Thr Tyr Ile Lys Leu Asp Lys Leu Gly Glu Gly Thr Tyr Ala Thr Val
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Val Ser Leu Leu Lys Asp Leu Lys His Ala Asn Ile Val Thr Leu His
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Asp Lys Asp Leu Lys Gln Tyr Leu Asp Asp Cys Gly Asn Val Ile Asn

210

215

220

Met His Asn Val Lys Leu Phe Leu Phe Gln Leu Leu Arg Gly Leu Ala
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Leu Leu Ile Asn Glu Arg Gly Glu Leu Lys Leu Ala Asp Phe Gly Leu
 260 265 270

Ala Tyr Ala Lys Ser Ile Pro Thr Lys Thr Tyr Ser Asn Glu Val Val
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Thr Leu Trp Tyr Arg Pro Pro Asp Ile Leu Leu Gly Ser Thr Asp Tyr
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Ser Gly Gln Ile Asp Met Trp Gly Val Gly Cys Ile Phe Tyr Glu Met
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Ala Thr Gly Arg Pro Leu Phe Pro Gly Ser Thr Val Glu Glu Gln Leu
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His Phe Ile Phe Arg Ile Leu Gly Thr Pro Thr Glu Asp Thr Trp Pro
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Gly Ile Leu Ser Asn Glu Glu Phe Arg Thr Tyr Asn Tyr Pro Lys Tyr
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Arg Ala Glu Ala Leu Leu Arg His Ala Pro Arg Leu Glu Cys Asp Gly
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Ser Ala Glu Asp Ala Met Lys His Pro Phe Phe Leu Ser Leu Gly Glu
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Arg Ile His Lys Leu Pro Asp Thr Thr Ser Ile Phe Ala Leu Lys Glu
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Ser Gly Arg Pro Ala Phe Arg Val Val Asp Thr Glu Phe
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A
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